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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/600,931 07/21/00 YAMAMOTO

K 362-43PCT/U

MMC1/0409

EXAMINER

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LEE, E

ART UNIT

PAPER NUMBER

2815

DATE MAILED:

04/09/01

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/600,931

Applicant(s)

YAMAMOTO ET AL.

Examiner

Eugene Lee

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 July 2000 is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 18) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Drawings*

1. FIG. 1 thru 4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).
2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: element 11 (see page 4, line 19). Correction is required.

### *Specification*

3. The disclosure is objected to because of the following informalities: there is no line IV-IV in Figure 3 (see page 3, line 25); there is a typographical error on page 4, line 8 (i.e. “ – “); there is a typographical error on page 1, line 24 (i.e. “especial”); there are grammatical errors (“so-called .... has being”) on page 1, lines 11-13. There are numerous other grammatical and typographical errors in the disclosure, and the applicant is required to correct the ones cited above and those *not* specifically mentioned.

Appropriate corrections are required.

### *Claim Objections*

4. Claim 9 is objected to because of the following informalities: Claim 9 contains a typographical error (i.e. claim 9 is dependent on itself). Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

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5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

6. Claims 1 thru 6 and 8 thru 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Jain '423. Jain discloses (see, for example, FIG. 13) a damascene interconnection comprising a conductor-filled trench (interconnection trench) 64 and insulating pillars (protrusions) 50. FIG. 10 shows a plan view of a pillared landing pad (pad trench) 55 where multiple protrusions are dispersed throughout.

FIG. 6 shows the damascene interconnection formed by a patterned insulating layer 22 over a substrate 20. Conducting segments (conductive film) 32, 44 and 46 lie between insulating pillars 38. In column 5, lines 34-45, Jain states that the incorporation of insulating pillars divides a wider conductor and, hence, minimizes dishing.

- a. Regarding claims 4 and 11, see FIG. 3 and element 38. Also, in column 6, lines 45-53, Jain states that many other insulating patterns may be construed that produce the same effect (i.e. reducing dishing by the narrowing of wide trenches).

### *Claim Rejections - 35 USC § 103*

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain '423 as applied to claims 1 thru 6 and 8 thru 13, and further in view of Jaso et al. '140. Jain does not show a damascene interconnection comprising a contact hole formed in said pad trench and electrically connecting between said conductive film and another conductive film arranged in a level lower than said insulating film. However, Jaso shows (see, for example, FIG. 8) a semiconductor device comprising interconnects formed by a damascene process. An aluminum layer 26 is connected to a lower conductive metal layer 14 by way of a filled metal via 18. It would have been obvious to one of ordinary skill in the art at the time of invention to include this metal via and conductive metal layer in Jain's invention in order to connect the conducting segments of Jain's invention to an underlying conductor within the substrate, as shown by Jaso.

#### **INFORMATION ON HOW TO CONTACT THE USPTO**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugene Lee whose telephone number is 703-305-5695. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 703-308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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Eugene Lee  
April 4, 2001

A handwritten signature in black ink, appearing to read 'Eddie Lee', is positioned above the printed name.

**EDDIE LEE**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2800**